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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
WANG, QUAN ZHEN	

ART UNIT	PAPER NUMBER
2633	

DATE MAILED: 01/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/991,126	NISSOV ET AL.	
	Examiner	Art Unit	
	Quan-Zhen Wang	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 November 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,9,10,12,15,26 and 27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6, 9, 10, 12, 15, and 26-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11/23/05* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings were received on November 23, 2005. These drawings are not acceptable since new matter is introduced. Nowhere does the specification, as it is originally filed, support the newly revised drawing. The original claim 1 and at page 7, lines 13-30 of the specification does not disclose the specific system configuration as shown in the newly revised fig. 1A. Therefore, the revision of fig 1A considered new matter. Furthermore, character 12 is used to represent "hybrid amplifier". The same character cannot be used to represent a completely different element, in the instant case "a receiver", in the same figure.

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "transmitter"; the "receiver"; the "feedback loop"; and "a plurality of Raman assisted EDFA hybrid amplifiers" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure

is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The substitute specification filed November 23, 2005 has not been entered because it does not conform to 37 CFR 1.125(b) and (c) because: new matter is introduced. Nowhere does the specification, as it is originally filed, support the newly revised drawing, nor the description of the newly revised drawing. The original claim 1 and at page 7, lines 13-30 of the specification does not disclose the specific system configuration as shown in the newly revised fig. 1A. Therefore, the revision of fig 1A considered new matter. Furthermore, character 12 is used to represent "hybrid amplifier". The same character cannot be used to represent a completely different element, in the instant case "a receiver", in the same figure.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-6, 9, 10, 12, 15, and 26-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "wherein each of said Raman amplifier variable gain portions is configured to provide an associated gain whereby each of said EDFA gain portions has substantially the same input power throughout said optical fiber communications link". However, it is not clear what the recited limitation means.

Claim 26, recites the limitation "configuring said Raman amplifier variable gain portions to provide an associated gain whereby each of said EDFA gain portions has substantially the same input power". However, it is not clear what the recited limitation means.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-6, 9, 10, 12, 15, and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onaka et al. (U.S. Patent US 6,785,042 B1).

Regarding claims 1, 26, as they are understood in view of the above 112 problems, Onaka discloses an optical communications system (figs. 47, 52, and 53) comprising: transmitter (fig. 47, optical sender OS 5) for transmitting an optical signal; receiver (fig. 47, optical receiver OS 6) for detecting the optical signal; and an optical fiber communications interposed between the transmitter and the receiver (fig. 47, the optical fiber links OS5 and OR 6), the optical fiber communications link comprising: a plurality Raman assisted EDFA hybrid amplifiers (fig. 47, the first EDFA and Raman amplifier system on the left hand side of first optical coupler 3A; and the second EDFA and Raman amplifier system between the first optical coupler 3A and second optical coupler 3A near OR 6; and figs. 52 and 53), each having Raman amplifier variable gain portion (fig. 47, the Raman amplification 7 directly connected to OS 5 and the Raman amplification 7 directly connected to first optical coupler 3A) and an EDFA gain portion (fig. 47, the EDFA 8 directly connected to the first optical coupler 3A, and the EDFA 8 directly connected to the second optical coupler 3A); wherein each of the Raman amplifier is inherently configure to provide an associated gain, and each of the EDFA has substantially the same input power (column 4, lines 44-53). The system of Onaka differs from the claimed invention in that Onaka does not specifically teach an optical attenuator coupled to the output of the EDFA gain portion. However, it is well known in the art to use an optical attenuator coupled to the output of an EDFA gain portion. For example, Onaka in another embodiment (fig. 31) discloses the use of an optical attenuator (fig. 31, attenuator 85) to couple the output of an EDFA gain portion. Therefore, it would have been obvious for one of ordinary skill in the art at the time

when the invention was made to incorporate an optical attenuator, such as the one disclosed in fig. 31, in the system of figs. 47, 52, and 53 to couple output of an EDFA gain portion in order to adjust the output power from the amplifier system.

Regarding claim 2, Onaka further teaches at least one dispersion-compensation fiber disposed between at least one of the Raman amplifier variable gain portions and at least one of the EDFA gain portions (fig. 53, DCF 84).

Regarding claim 3, the system of Onaka differs from the claimed invention in that Onaka does not specifically teach that at least one dispersion-compensation fiber disposed within the Raman amplifier variable gain portion. However, it is well known in the art to include dispersion-compensation fiber disposed within the Raman amplifier variable gain portion. For example, Onaka in another embodiment (fig. 29) discloses to include dispersion-compensation fiber (fig. 29, DCF9) disposed within the Raman amplifier variable gain portion. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to include dispersion-compensation fiber disposed within the Raman amplifier variable gain portion in order to compensate the attenuation of the optical signal in the dispersion compensation fiber.

Regarding claim 4, Onaka further discloses that the EDFA gain portion comprises a multi-stage EDFA (fig. 52).

Regarding claim 5, Onaka further discloses that a least one dispersion-compensation fiber disposed between stages of the multi-stage EDFA (fig. 52, DCF84).

Regarding claim 6, Onaka further discloses that the optical fiber communication link comprises plurality of optical fiber spans varying lengths connected and arranged between the transmitter and the receiver (fig. 47).

Regarding claim 9, Onaka further discloses that the optical attenuator of each the plurality of Raman assisted EDFA hybrid amplifiers is configured to reduce the output power of the EDFA gain portion (fig. 31, column 20, lines 54-65).

Regarding claims 10, and 27, Onaka differs from the claimed invention in that Onaka does not specifically teach that the optical attenuators are configured for reducing the output power of the EDFA gain portions in1 dB increments. However, Onaka further teaches that the attenuator is used to control the output power. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to configure the attenuators to reduce the power in 1 dB or other appropriate increments to optimize the power launched into next adjacent Raman assisted EDFA hybrid amplifier in order to optimize the performance of the system.

Regarding claim 12, Onaka differs from the claimed invention in that Onaka does not specifically teach that the optical attenuator of each plurality of Raman assisted EDFA hybrid amplifiers is configured to reduce the output power of the EDFA gain portion to provide an optimum power to be launched into the next adjacent Raman assisted EDFA hybrid amplifier. Raman amplifier variable gain portions are manually adjusted until the EDFA gain portions have substantially the same input power throughout the optical fiber communications link. However, Onaka further teaches to

adjust the Raman amplifier variable gain portions (column 3, lines 22-67, and column 4, lines 1-65; column 4, lines 44-53). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to configure the optical attenuator of each plurality of Raman assisted EDFA hybrid amplifiers to reduce the output power of the EDFA gain portion to provide an optimum power to be launched into the next adjacent Raman assisted EDFA hybrid amplifier.

Regarding claim 15, it is well known that the optical fiber span lengths range can be from about 30 to about 110 km.

Response to Arguments

8. Applicant's arguments filed November 23, 2005 have been fully considered but they are not persuasive. The Applicant argues that "Onaka is generally directed to a system wherein the optical power among respective channels of a WDM system is equalized by applying gain tilt compensation" and "Applicants find nothing in Onaka that teaches or suggest a system or method as set forth independent claims 1 and 26". The Examiner respectfully disagrees with the Applicant. Onaka discloses several embodiments of hybrid Raman and EDFA amplifier systems. The combination of selected embodiments of Onaka discloses every limitation of the claimed invention. Onaka discloses that the invention "provides a method for controlling wavelength characteristics of optical transmission powers caused in WDM signal light transmission path by Raman amplification" (column 3, lines 22-25). Onaka further discloses that "the wavelength characteristics of optical transmission powers after Raman amplification are

monitored to thereby control the gain wavelength characteristics of Raman amplification" (column 4, lines 11-14). It clearly shows that Onaka not only monitors the power of the light, Onaka also monitors the characteristics of the optical power. One of ordinary skill in the art would recognize that Onaka not only covers the monitoring of optical power, as it is claimed by the Applicant, but also covers more than what is claimed by the Applicant. Therefore, the claimed invention is clearly anticipated by the combination of selected embodiments of Onaka and the rejection to claims 1 and 26 still stands. For the same reasons, the rejection to other 2-6, 9, 10, 12, 15, and 27 still stands.

9. In addition, Friedrich discloses hybrid optical amplifiers including EDFA and a Raman amplifier to reduce the noise generated from the amplifier. Islam discloses multi-stage optical amplifiers including EDFA and Raman amplifiers. An obvious modification of either Friedrich or Islam would leads to a system anticipating the claimed invention.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Taylor et al. (U.S. Patent US 6,178,038 B1) discloses a optical amplifier with Raman pumped dispersion compensation fiber to improve noise figure; Friedrich (U.S. Patent US 6,466,362 B1) discloses hybrid optical amplifiers including EDFA and a Raman amplifier to reduce the noise generated from the amplifier; Islam

(U.S. Patent Application Publication US 2003/0058523 A1) discloses multi-stage optical amplifier including EDFA and Raman amplifiers.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quan-Zhen Wang whose telephone number is (571) 272-3114. The examiner can normally be reached on 9:00 AM - 5:00 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

M. R. SEDIGHIAN
PRIMARY EXAMINER

qzw
1/22/2006